CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.06/VC/CSR-09/134b/CEMENT/2016-17 Date: 03.09.2016

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
*AGENCY		**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
*NAME OF THE WORK	:	Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE		AEE(BS)/PR/25/2016-17 Dated: 02.09.2016
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	02.09.2016
PERIOD OF TESTING	:	02.09.2016 to 03.09.2016

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	29.50 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	165 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	495 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

****

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Job No.: CTCE/BBMP/W.No.06/VC/CSR-09/134b/SAND-Gradation/2016-17 : 03.09.2016

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES

*** Customer** : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

*** Agency** : **Mr. V. Chandrappa,**
#681, Dasarahalli, Bangalore – 24.

*** Name of Work** : Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.

Reference : AEE(BS)/PR/25/2016-17 Dated: 02.09.2016

Technical Reference : IS : 2386 Part 1 - 1963 RA-2007

Sample ID : Fine Aggregates

Sample Received on : 02.09.2016

Date of Testing : 03.09.2016

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	100	100	100	100
4.75	92.10	90-100	90-100	90-100	95-100
2.36	73.60	60-95	75-100	85-100	95-100
1.18	52.40	30-70	55-90	75-100	90-100
600 Micron	23.80	15-34	35-59	60-79	80-100
300 Micron	8.30	5-20	8-30	12-40	15-50
150 Micron	2.00	0-10	0-10	0-10	0-15

*Information is furnished by the Customer/Representative.

Remarks : This sample is under Zone-I specific limits.

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Job No.: CTCE/BBMP/W.No.06/VC/CSR-09/134b/AGG/GR/2016-17 : 03.09.2016

TEST REPORT ON DETERMINATION GRADATION OF COARSE AGGREGATES

* Customer	: **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	: **Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
* Name of Work	: Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	: AEE(BS)/PR/25/2016-17 Dated: 02.09.2016
Technical Reference	: IS : 2386 Part 1 -1963 RA-2007
Sample ID	: Coarse Aggregates (40mm)
Sample Received on	: 02.09.2016
Date of Testing	: 03.09.2016

Total Wt. of Aggregates in gms= **7000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)	
		Graded	Single Sized
80	100	100	-
63	100	-	100
40	97.79	95-100	85-100
20	37.36	30-70	0-20
10	11.86	10-35	0-5
4.75	4.29	0-5	-

* Information is furnished by the Customer/Representative

Remarks : This sample is under Graded specific limits.

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Job No.: CTCE/BBMP/W.No.06/VC/CSR-09/134b/AGG/GR/2016-17 : 03.09.2016

TEST REPORT ON DETERMINATION GRADATION OF COARSE AGGREGATES

* Customer	: **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
* Agency	: **Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
* Name of Work	: Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	: AEE(BS)/PR/25/2016-17 Dated: 02.09.2016
Technical Reference	: IS : 2386 Part 1 -1963 RA-2007
Sample ID	: Coarse Aggregates (20mm)
Sample Received on	: 02.09.2016
Date of Testing	: 03.09.2016

Total Wt. of Aggregates in gms= **5000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS :383-1970 (RA- 2007)	
		Graded	Single Sized
40	100	100	100
20	96.06	95-100	85-100
10	33.02	25-55	0-20
4.75	3.32	0-10	0-5

* Information is furnished by the Customer/Representative

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Remarks : This sample is under Graded specific limits

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Job No.: CTCE/BBMP/W.No.06/VC/CSR-09/134b/CUBE/2016-17 23.09.2016

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

*Customer	: **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
*Agency	: **Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
*Name of the work	: Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	: AEE(BS)/PR/25/2016-17 Dated: 02.09.2016
*Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
*Grade of Concrete	: M_{20}
Compressive Strength as on	: 7th day
Sample Received on	: 23.09.2016

Sl.No.	*Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	16.09.2016	23.09.2016	8.156	356.8	15.86
2	16.09.2016	23.09.2016	8.274	363.5	16.16
3	16.09.2016	23.09.2016	8.362	379.2	16.85

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Job No.: CTCE/BBMP/W.No.06/VC/WMM/Gradation/2016-17 : 19.09.2016

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.

Agency : **Mr. V. Chandrappa,**
#681, Dasarahalli, Bangalore – 24.

Name of Work : Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.

Reference : AEE(BS)/PR/25/2016-17 Dated: 02.09.2016

Date of Testing : 19.09.2016

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **7840**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	285	285	3.6	96.4	95-100
22.4	2460	2745	35.0	65.0	60-80
11.2	1145	3890	49.6	50.4	40-60
4.75	1035	4925	62.8	37.2	25-40
2.36	925	5850	74.6	25.4	15-30
0.600	740	6590	84.1	15.9	8-22
0.075	965	7555	96.4	3.6	0-8

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Job No.: CTCE/BBMP/W.No.06/VC/WMM/AIV/2016-17 19.09.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
Name of the Work	Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	AEE(BS)/PR/25/2016-17 Dated: 02.09.2016
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	19.09.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	387	390	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	303	308	
4	Aggregate Impact value = percent fines	21.71	21.03	
	100* (W_2/W_1)%			21.37

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.06/VC/WMM/S-T/2016-17 19.09.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
Name of Work	Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	AEE(BS)/PR/25/2016-17 Dated: 02.09.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	19.09.2016

Result : Flakiness Index = **12.56%**

Elongation Index = **13.84%**

Result : Combined Flakiness & Elongation index 26.40%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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T-2377

Job No.: CTCE/BBMP/W.No.06/VC/CSR-09/134b/QB(SDBC)/2016-17 21.09.2016

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	**Asst. Executive Engineer**, Byatarayanapura Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
*NAME OF THE WORK	:	Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	:	AEE(BS)/PR/25/2016-17 Dated: 02.09.2016
*SAMPLE ID	:	Bitumen
DATE OF SAMPLING	:	19.09.2016
DARE OF TESTING	:	21.09.2016

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	92	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	44	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	294	Min. 220

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Job No.: CTCE/BBMP/W.No.06/VC/CSR-09/SDBC/AIV/2016-17 21.09.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
Name of the Work	Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	AEE(BS)/PR/25/2016-17 Dated: 02.09.2016
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	21.09.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	389	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	87	88	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	301	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.54	22.62	22.58

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.06/VC/SDBC/Shape_T/2016-17 : 21.09.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	: **Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
Name of Work	: Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	: AEE(BS)/PR/25/2016-17 Dated: 02.09.2016
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 21.09.2016

Result : Flakiness Index = **11.84%**

Elongation Index = **13.63%**

Result : Combined Flakiness & Elongation index **25.47%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.06/VC/SDBC/Bit/2016-17 23.09.2016

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC:SP:-1984

CUSTOMER	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
NAME OF THE WORK	Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	AEE(BS)/PR/25/2016-17 Dated: 02.09.2016
SAMPLE I/D	Roads in Chowdappa Layout Ward No.06
DATE OF TESTING	23.09.2016

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.00
7. Bitumen content in %	5.00	5.20
8. Average	**5.10**	

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Job No.: CTCE/BBMP/W.No.06/VC/SDBC/Bit/2016-17 23.09.2016

BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
NAME OF THE WORK	Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
REFERENCE	AEE(BS)/PR/25/2016-17 Dated: 02.09.2016
SAMPLE I/D	Roads in Chowdappa Layout Ward No.06
DATE OF TESTING	23.09.2016

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	25.36	5.34	5.34	94.66	90-100
4.75	261.4	55.03	60.37	39.63	35-51
2.36	56.48	11.89	72.26	27.74	24-39
1.18	36.52	7.69	79.95	20.05	15-30
0.3	35.12	7.39	87.34	12.66	9-19
0.075	32.45	6.83	94.17	5.83	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	36.52	7.70	7.70	92.30	90-100
4.75	253.8	53.54	61.25	38.75	35-51
2.36	57.43	12.12	73.36	26.64	24-39
1.18	35.29	7.45	80.81	19.19	15-30
0.3	34.12	7.20	88.01	11.99	9-19
0.075	33.65	7.10	95.11	4.89	3-8

Note:

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CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.06/VC/SDBC/AGG/2016-17 23.09.2016

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Byatarayanapura Sub Division, BBMP, Bangalore.
Agency	**Mr. V. Chandrappa,** #681, Dasarahalli, Bangalore – 24.
Name of the Work	Improvements to Roads and Drains at Left hand side of Government School (Chowdappa Layout) Dasarahalli in Ward No.06, Byatarayanapura Sub Division, BBMP, Bangalore.
Reference	AEE(BS)/PR/25/2016-17 Dated: 02.09.2016
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	23.09.2016

Total Weight of Sample: **5200** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	375	7.2	7.21	92.79	90-100	
4.75	2625	50.5	57.69	42.31	35-51	
2.36	710	13.7	71.35	28.65	24-39	
1.18	465	8.9	80.29	19.71	15-30	
0.3	420	8.1	88.37	11.63	9-19	
0.075	315	6.1	94.42	5.58	3-8	

Total Weight of Sample: **5250** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	425	8.1	8.10	91.90	90-100	
4.75	2580	49.1	57.24	42.76	35-51	
2.36	925	17.6	74.86	25.14	24-39	
1.18	475	9.0	83.90	16.10	15-30	
0.3	230	4.4	88.29	11.71	9-19	
0.075	285	5.4	93.71	6.29	3-8	

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